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# **Worldwide Report**

**NUCLEAR DEVELOPMENT AND PROLIFERATION**

**No. 54**



**FOREIGN BROADCAST INFORMATION SERVICE**

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31 July 1980

WORLDWIDE REPORT  
NUCLEAR DEVELOPMENT AND PROLIFERATION

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CANADA REMISS IN SHIPPING URANIUM TO SWITZERLAND

Geneva JOURNAL DE GENEVE in French 24-26 May 80 p 8

[Article by Anne-Marie Ley]

[Text] In the face of the boycott Switzerland has been suffering for almost 3 years in its uranium supplies from Canada, the Federal Council, contrary to its first intention, may have decided to show its teeth and to postpone for the moment the signature of the additional protocol submitted by Canada to the nuclear cooperation agreement between the two countries. After some delay, the Sulzer company was to obtain its permit to export to Argentina a plant for the production of heavy water! Furthermore, the Swiss companies which are operating the nuclear power stations of Goesgen and Leibstadt may still be waiting for about 910 tons of natural uranium from Canada. Finally, in the Muhleberg and Bernau nuclear power stations, the irradiated fuel elements which have to wait for the U.S. to give the green light for reprocessing, are piling up. These are the four elements noted by the TAGES ANZEIGER in its Thursday edition to support the discussion of the pressures Switzerland is suffering in the nuclear sector, on the part of Canada and the United States.

According to a source close to the Federal authorities, Canada has been blocking for almost 3 years its uranium stocks meant for Switzerland because it wished to renegotiate its bilateral agreements by imposing stricter conditions on them. The reason is that Canada was shocked in 1974 when India exploded its nuclear bomb, the more so as it was helping that country in the nuclear sector. This is what prompted it to display greater severity in the area of nuclear cooperation. To return to Switzerland, the negotiations with Canada are over and as soon as the French version of the additional protocol has been approved, it will be up to the Federal Council to sign it. For Switzerland to be bound by this protocol in accordance with the international public law, the Federal Chambers must approve it and it should then be ratified by the government. According to an official source, Canada may release its uranium supplies as soon as the Federal Council has signed the additional protocol.



As regards the permit to be granted to Sulzer for the export of a heavy water production plant, it should be granted shortly, since Argentina has accepted all the conditions imposed by the international nuclear non proliferation treaty, that is, it engaged to guarantee on one hand that the plant supplied by Switzerland be used solely for peaceful purposes, and that it would not be used for the manufacture of explosives, and on the other hand, submit the heavy water produced by this plant to the control of the International Atomic Energy Agency (IAEA) in Vienna. This transaction between Argentina and Switzerland aroused the anger of the United States because they had recommended a different concept in the matter of control, especially because of the moratorium they had imposed on themselves in 1977 in the sector of the development of nuclear energy. This concept would have the IAEA control all the nuclear activities deployed for peaceful purposes. On the other hand, the "philosophy" recommended in particular by Switzerland would advise limiting the controls to equipment supplied to a third country. It may be noted that Argentina possesses already the technology needed for the production of heavy water; the contract it has signed with Sulzer would simply permit it to speed up the implementation of its nuclear program.

The TAGES ANZEIGER says also that the power stations of Goesgen and Leibstadt are waiting rather anxiously for the 910 tons of uranium blocked in Canada to be finally released to them. By the way, according to a source close to the operators of the nuclear power stations, this blocking may be attributed to Canada's decision to revise all its agreements on cooperation for the purpose of tightening the screws. For the moment this does not pose too many problems to the operators of these power stations since they were able to find other suppliers to satisfy their immediate needs. Finally, in connection with the irradiated fuel elements which are piling up in the "swimming pools" of Muhleberg and Beznau, there is no need, either to worry too much in the immediate future, for the operators of the power stations have simply increased the storage capacity to 6 years, for example for Beznau. Actually, the United States have changed their attitude over the past 3 years. Seeing that it was in the United States that the fuel elements were enriched, that country has the right of examination of the reutilization of these elements by virtue of its agreement of cooperation with Switzerland; to this end, it grants a right of transfer. What had been formerly a mere formality has now become more difficult since the United States grants the permit individually for each case. The reason for this procedure may also be found in the moratorium decreed by President Carter in 1977. At present the situation is evolving, but Mr Carter has a very narrow maneuver margin in this election year of 1980. Nevertheless, it seems that the United States appear inclined to set up more coherent regulations as regards the criteria of reutilization of fuel elements, which, obviously requires time. In conclusion, therefore, the power station operators contemplate with serenity the future in this area also.

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CSO: 5100

BRIEFS

KUWAIT INVESTING IN NIGER URANIUM--Niamey, July 1 (AFP)--Kuwait has decided to participate in uranium mining in Niger, the government newspaper LE SAHEL said today. The report was from the newspaper's correspondent with President Seyni Kountche on his tour of Middle East and gulf states. LE SAHEL said that under a cooperation agreement with Niger, Kuwait will put a significant amount of capital into the Tassa Ntaghague Company that mines deposits of more than 20,000 tons in the Arlit region of northern Niger. Kuwait has also loaned money toward the production of uranium from another deposit, at Imouraren, LE SAHEL added. The Tassa Ntaghague Company was formed in 1978. Its initial capital of 7,000 million CFA francs (35 million U.S. dollars) is held 50-50 by the Niger Office of Mineral Resources and the Nuclear Material General Company (COGEMA) of France. The Imouraren deposit, 70 km (40 miles) south of Arlit, is to be put into production jointly by the French Atomic Energy Commission, the Continental Oil Company of the United States and the Niger Government through its mineral resources office. [Text] [ABO11135 Paris AFP in English 0920 GMT 1 Jul 80]

CSO: 5100



VICTORIA'S PREMIER COMMENTS ON NUCLEAR POWER STUDY

Canberra THE AUSTRALIAN in English 26 Jun 80 p 9

[Report by Brendan Donohoe]

[Text]

**T**HE electricity dispute is not the only power dispute happening in Victoria at the moment.

The Premier's Department seems to be divided, or confused, over the question of possible nuclear power stations.

The State Government has always boasted of its policy not to build nuclear power stations in Victoria.

But, while the Premier, Mr Hamer, was abroad on a 3½-week trade mission, the State Electricity Commission brought to Victoria two consultants from the British Electricity Generating Board, to study four sites for the SEC, which has a "notional" plan for development of nuclear power.

The acting Premier, Mr Thompson, said: "If we are to go nuclear in the 1990s, we should be planning for it now."

"This is not a matter of reverting solely to nuclear: it could be used in a complementary fashion with our brown coal reserves."

Then yesterday, Mr Hamer, back from his trade

mission where he looked at coal-to-oil plants in South Africa, outlined the great interest shown around the world in Australia's mineral and energy resources.

Mr Hamer said that an agreement between the West German Government and other interests and the Federal, Victorian, NSW and Queensland governments for coal supplies, would be finalised by June next year, if the feasibility studies were successful.

But Mr Hamer was not pleased when asked to explain the paradox of the Government's nuclear policy and the presence of two British consultants.

Mr Hamer quickly said everything had been blown out of proportion.

"The the SEC is charged under its charter to keep tabs on alternative means of generating power," he said.

"They are acting on some confirmation of a feasibility of providing nuclear power here for reasons of comparison."

When asked why there was a need for comparisons when it went against State policy, he replied: "All they (the SEC) have done is asked the British board to give a proper costing."

## AUSTRALIA

### PAPER DISCUSSES PROBLEMS OF NUCLEAR WASTE DISPOSAL

#### Australia's 'Vital Role'

Canberra THE AUSTRALIAN in English 30 Jun 80 p 6

[Editorial: "Dumping Nuclear Waste"]

[Text]

THE news that the United States is investigating the possibilities of dumping high-level nuclear waste beneath the floor of the Pacific will not be reassuring to the small island nations who for years have strenuously opposed any kind of nuclear activity in the region. And Australia, as a not-so-small Pacific nation and one with more international clout than most, has a duty to monitor the proposal very carefully indeed.

The plan has already sparked anger and dismay in Hawaii and Guam and there is no reason to suppose it will provoke anything different in Samoa, the Philippines, Fiji, Papua New Guinea, Tonga, Tuvalu. . . or, for that matter, Canberra.

That American officials describe exploration work near Palmyra Island as a mere "preliminary look" at

nuclear waste storage and say the concept of seabed disposal is "many years away", will not be particularly reassuring either. The Japanese already plan to dump cement drums containing nuclear waste into the northern Pacific during the middle of next year and disposal in the ocean is obviously an option in America's attempts to frame a suitable nuclear waste-disposal program for the medium, if not long term.

An aspect of the situation which may perplex the Foreign Affairs Minister, Mr Peacock, when he gets around to reviewing the situation after his trip to Malaysia, is that the Americans have apparently chosen to conduct their tests in comparative secrecy. The politicians in Washington have already passed resolutions calling on the Carter administration to consult with Congress. They might

been added that consultation with the people in the region, who will be most affected, might not come amiss.

This is not to say that sensible scientific efforts to solve the nuclear waste problem should not take place. Indeed, we have argued time and again that despite environmentalists' misgivings, the world has reached the point of no return in its need for nuclear energy. We believe that as a uranium supplier Australia has a vital role to play. We are quite certain the last is wrong to turn its back on uranium mining as a source of creating jobs and wealth, and of much-needed energy.

Sensible, meticulous research into the safest method of disposing of the potential killer that is radioactive waste is to be applauded. But to spring news of seabed disposal exploration on a host of small, so-often-disregarded Pacific nations is neither sensible, sensitive nor politic.

#### South Pacific Reaction Expected

Antenna THE AUSTRALIAN in English 2 Jul 80 p 3

(Page 1)

SOUTH Pacific countries, including Australia and New Zealand, are expected to react strongly against US plans to dump high-level nuclear waste in the Pacific when the South Pacific forum meets two weeks from now in semi-independent Kiribati.

The forum, representing the great majority of independent islands in the region, is also expected to censure Japan, France and China.

Japan has plans for deep-water dumping off Iwo Jima. France is continuing nuclear testing and is reported to be moving into neutron bomb testing and China is expected to fire more missiles into the area.

Last year the forum sent a strongly worded note condemning US plans then to use Palmyra Island, 1000 sea

miles south of Honolulu, to dump spent nuclear fuel.

There could be a move at the forum from a few nations to work towards the declaration of the South Pacific as a nuclear-free zone.

There could also be a move to specify types of waste products to be prohibited and this could cause Australia some embarrassment.

Last year the motion simply condemned the dumping of nuclear waste and Australia found it easy to be a signatory to such a declaration.

But if the forum starts to specify countries, conditions and types of waste not to be dumped, Australia could be find its relations with some of its allies compromised.

# HOW THE 'NUCLEAR-FREE ZONES' ANALYSIS

FROM THE WEST AUSTRALIAN IN English of the 1980s

Article by the author: "Nuclear-Free Zones—What Is the Point?"

[The]

A FEW weeks ago a Wanneroo man wrote to his local shire suggesting it should declare the area a frost-free zone. Market gardeners, he thought, would benefit most from the milder weather.

Though tongue-in-cheek, it gives an indication of one attitude towards the controversy over local government declarations of nuclear-free zones.

Some critics see them as a piece of imprudent nonsense dreamed up by left-wing councillors fallen under the sway of anti-nuclear groups.

They point to the lack of powers in the Local Government Act to make the decision at all as only heightening the absurdity of the whole issue.

And, bearing in mind the Wanneroo man's joke, cynics would add that councils might as well attempt to change the weather by their actions as influence a liberal government intent on preparing the ground for a nuclear future.

But opponents of nuclear power see nuclear-free zones as an

important statement of principle at the grass roots level of government, and one that governments ignore at their own peril.

Nuclear-free zones may be in their infancy in WA (Fremantle has earlier declared, and now Cockburn and Wanneroo have followed suit), but the last two years have seen a rush by councils in inner Melbourne to declare themselves nuclear-free, with New South Wales following.

## Survey

Figures compiled by the City of Fremantle's senior administration officer, Mr David Berry, indicate that at least 16 councils in Melbourne and seven in NSW have been declared nuclear-free, with others considering the move.

In Queensland only one shire—Norma—has declared itself.

Mr Berry says that at least three councils in Adelaide have the matter under consideration.

Precise figures on the number of nuclear-free councils Australia-wide are hard to come by.

Because the zones are

outside the provisions of the local government acts in each State, few local government departments or associations are attempting to keep accurate records.

A survey of nuclear-free zones in the Eastern States is war.

• Most of the councils are in inner city, Labour-dominated areas, or around ports that are backed by heavy industry. In Melbourne the 16 councils include Collingwood, Fitzroy, Williamstown, South Melbourne, Coburg and the City of Port Melbourne.

In NSW they include suburban Waverley and Leichhardt and the south coast industrial areas of Wollongong, Shellharbour and Kiama.

• Declarations of a nuclear-free zone vary from a simple statement of support for the concept of a non-nuclear future, through to detailed motions prohibiting the mining and processing of uranium linked to a ban on the transportation of nuclear material or waste through streets. Dumping of waste within the

boundaries is usually added to the bans.

Most councils have exempted the responsible use of radionuclides for medical purposes from the transportation ban.

A number of councils, particularly in inner Melbourne, have backed up their declarations by erecting anti-nuclear signs on roads leading into their cities.

• Councils recognise that if the zones and transportation bans are to be enforceable, there will have to be changes to powers under the Local Government Act.

Some town clerks in Melbourne described anti-nuclear decisions by their councillors as "totally unenforceable," "a pious statement of intent", and "taken opposition".

Collingwood town clerk, Mr Dudley Cook, two years ago summed up the council decision to go nuclear-free: "We believe we were the first, but there's no statutory significance in the move."

"We simply resolved to put up the signs, but at least they draw a good deal of attention to the nuclear issue," he said.

## Boost

Anti-nuclear strikes were boosted late last week when the Melbourne City Council, the largest and a non-observant council, voted to endorse the principle of a nuclear-free zone.

In deputy town clerk, Mr. Joe Heilly, said the move was a step to subvert councillors who felt they should follow the wave of adjoining council movements that had declared themselves nuclear-free.

Council still supported the principle, but was not prepared to do anything about it unless the State Government gave us the powers, Mr. Heilly said.

The case of inner city Leichhardt in Sydney is perhaps most instructive of the problems facing councils that are determined to give bite to their nuclear-free status.

From time to time trucks rumble through its streets taking uranium yellowcake from stockpiles at the Lucas Heights research establishment to the container terminal at Glenside Island which is within the municipal boundaries.

## Barricades

A spokesman for the Australian Atomic Energy Commission revealed that uranium mining companies are permitted to draw on Commonwealth stockpiles at Lucas Heights to honour overseas contracts while waiting for their own mines to come on-stream.

The yellowcake which had been mined at Rum Jungle, was shipped overseas in steel drums aboard

container ships, the spokesman said.

When the Leichhardt Municipal Council got in hear of trucks rumbling through its streets with the yellow cake, it declared itself nuclear-free and authorised council staff to erect barricades in the street to stop the trucks.

Subsequent legal advice warned against such a move, and the council in April this year settled for anti-nuclear signs and a letter to the State Government urging changes to the Local Government Act to give councils the power to close off streets.

But a clever man never has allowed Leichhardt to put up its anti-nuclear signs and stay within the Local Government Act.

Under a section of the NEW Act councils are permitted to advertise the tourist attractions of their area.

Admitted, Alderman Tony Kelly, one of the leading figures in the council's nuclear debate: "Perhaps it's drawing a long bow to say a nuclear-free zone makes the area more attractive to tourists and visitors, but we've done it, and the first sign is now going up."

Footnote: The Fremantle City Council is preparing an amendment to its town planning scheme declaring nuclear power a noxious industry, and so prohibited under its scheme. It is believed to be the first council to attempt to use its town planning powers to give a legal back to its opposition to nuclear power.

## AUSTRALIA

### COCKBURN DECLARES ITSELF A NUCLEAR-FREE ZONE

FROM THE WEST AUSTRALIAN In English 26 Jun 80 p 17

(Text) The Cockburn City Council has declared itself a nuclear-free area.

A meeting of the council this week voted overwhelmingly to adopt the move after weeks of mounting pressure on councillors to take a firm stand on the issue.

The Mayor of Cockburn, Cr Don Miguel, said that the council had slowly been pressed into this situation by the rate payers, the news media and adjoining councils.

It was difficult to make a responsible decision on such a vast and complicated issue, but he hoped that each councillor had given the matter a good deal of thought.

Cr Miguel said he believed that a strong affinity with Apartheid was imperative for Australia's survival, but he did not believe that nuclear submarines should be put into Cockburn Sound.

In putting the motion, Cr Denis de Young said that the fact that the Government was looking at the development of nuclear power was a backward step for the people of WA.

"You only have to look at the tragedies that have occurred elsewhere," he said.



## SELF-SUFFICIENCY 'ESSENTIAL' IN NUCLEAR FIELD

Calcutta THE STATESMAN in English 23 May 80 p 8

[Editorial: "Heavy Water From Russia"]

[Text]

It is only moderately reassuring that more heavy water will be available from the Soviet Union without "full-scope safeguards". When 200 tonnes were obtained for the Rajasthan atomic power plant, there was apparently some uncertainty about the scope of safeguards. The Russians have since agreed to supply 200 tonnes more which may be used for any nuclear power station. Safeguards devised by the International Atomic Energy Agency will, of course, be applied to any plant making use of Soviet-supplied heavy water but the Russians have not required India to place all her nuclear facilities under external safeguards. This is not an extraordinarily generous gesture. American assistance for Tarapur and Canadian for Rajasthan were obtained on the same basis. Canadian policy changed after the Pokhran explosion. Washington, too, pressed India to accept full-scope safeguards. But American fuel supplies for Tarapur have so far been obtained

without them. The Soviet attitude seems helpful only in comparison with what the Canadians did and the Americans wanted after years of satisfactory collaboration. And it was not always so reasonable: negotiations for supplies from Russia have taken a long time.

That Moscow has not earmarked the additional 200 tonnes for any particular power plant may be a bigger help; since the second unit in Rajasthan will need exactly this amount for the first charge, the 200 tonnes which will be left over can meet most of the initial requirements of the Madras power station's first unit. But it will not be long before more is needed. Even when mentioning tentative dates for completion of nuclear power projects, the authorities now say that the estimates are "subject to availability of heavy water".

There are no assured supplies from abroad; nor were any expected when a nuclear power programme, with reactors fuelled by natural uranium and moderated by heavy water, was first conceived. It was then assumed that both fuel and moderator would be produced in India in adequate quantities. But the record of heavy water projects has been dismal. The Haroda plant was shut down after an accident, and the projects at Kota, Tuticorin and Talcher have long been plagued by a variety of problems. Plans for new plants are only of academic interest now. Yet recent experience, including that of negotiating supplies from Russia, has shown that atomic power planning on present lines is futile without first ensuring an adequate output of heavy water. This should reinforce the lesson to be drawn from Tarapur's fuel problem: self-sufficiency, which can be achieved only by self-reliance, is not merely desirable, but essential in the nuclear field.

## FRANCE MAY HELP DEVELOP ENERGY RESOURCES

New Delhi PATRIOT in English 5 May 80 p 6

[Text]

FRANCE has shown keen interest in helping India explore its vast coal deposits and taking back part of the production.

It has also indicated its willingness to assist India in a big way in its energy resource development programme, reports UNI.

France, which has the world's most ambitious nuclear energy development programme, has indicated that it was prepared to cooperate with India in this field too.

Top officials of the French Ministry of Energy have conveyed to India that they felt there was a vast scope for French collaboration in augmenting the energy resources.

France has declared that by the year 1990, it would produce one-third of its total energy requirements through nuclear power and that they would be setting up four atomic power plants every year.

## SOLAR ENERGY

In this context, France was told India that it could also assist India in alternate sources of energy and conversion of energy. France has developed more efficient industrial engines which consume less of oil and petroleum products.

India is now studying the prospects for collaborating with France in the field of solar

energy to energise agricultural pumps.

Several proposals for widening Indo-French collaboration were discussed during the visit here of French President Valéry Giscard d'Estaing and External Affairs Minister F. V. Narasimha Rao's visit to Paris.

These proposals were discussed further during the just concluded visit of Mr Homesh Bhandari, secretary in the Ministry of External Affairs.

Mr Bhandari, besides meeting top officials of various Economic Ministries of France, also conferred with French Foreign Minister Jean Francois Poncet.

These talks have revealed that considerable scope existed in diversifying Indo-French collaboration in such vital fields of economic activity.

As a follow-up action, the French Government has decided to send some economic and technical delegations to India. Some Economic Ministries of France are also likely to pay official visits this year.

Since France has already helped India set up the Institute of Petroleum in Dehradun, they are now willing to assist India in exploration, development and research in new technologies both instrumentation and solar energy.

## REPORT DETAILS BENEFITS OF SOVIET HEAVY WATER

Bombay THE TIMES OF INDIA in English 15 May 80 p 1

[Text]

**P**ROGRESS OF construction of the second 220 Mw. unit of the Rajasthan atomic power plant has brightened, following an understanding with the Soviet Union over the use of heavy water supplied by it.

The construction of the unit had been completed more than a year ago and its nuclear systems had been commissioned with light water and kept operational. The unit could not be commissioned because of non-availability of adequate quantity of heavy water. About 250 tonnes of heavy water is required for the initial charge.

The Soviet Union had started supplying heavy water more than two years ago for this plant and, by last year, India had 200 tonnes of heavy water available. However, differences over the scope of the safeguards for the RAPP unit 2 made the government of India hesitant in using this heavy water for commissioning the power plant.

Now, with the USSR agreeing to give another 250 tonnes of heavy water for "any power station", the doubts have been cleared not only for the commissioning of the RAPP unit but also for the first unit of the Madras nuclear power plant which will need the initial charge of heavy water soon.

The Soviet Union seems to have appreciated India's stand against full-scope safeguards and will be content with the earlier agreement which required enforcement of IAEA safeguards on the facility using the supplied material. The heavy water supplied by the Soviet Union is covered under an IAEA agreement signed in 1977. These safeguards are similar to those India had accepted for Tarapur, with India, U.S. and the IAEA being parties to the agreement.

The Soviet Union had agreed to supply heavy water for the Rajasthan project after Canada had abruptly withdrawn its assistance in the nuclear field in 1976.

Both Canada and the U.S. have been insisting upon full-scope safeguards in accordance with their policies. India has not succumbed to any pressure as it considers such safeguards discriminatory. It has allowed its atomic energy programme to suffer rather than compromise on principles.

While the U.S. President, Mr. Carter, has softened his stand on India's request for assured supplies of the contracted quantity of enriched uranium, France and the Soviet Union have also indicated their willingness to expand the scope of their cooperation with India in the nuclear field.

In fact, the Soviet Prime Minister, Mr. Alexei Kosygin, during his visit early last year, had conveyed an offer

to set up a large nuclear power plant in India. The Janata government did not respond to this offer. The proposal may be revived.

Even if Soviet cooperation solves India's heavy water problem, it will give a boost to India's nuclear power generation programme. The Rajasthan unit can attain criticality within a period of four months after receipt of full charge of heavy water. The first 220 Mw. unit of the Madras power plant is also expected to go critical this year.

Indigenous production of heavy water has been far too inadequate to meet these requirements. That is why the Rajasthan unit remains undisturbed long after its commission and uncertainty has delayed the commissioning of the Madras unit. All government statements about commissioning schedules are generally prefaced by "subject to the availability of heavy water."

Heavy water production has been lagging behind because of various factors, including accidents, power shortages and labour troubles.

The old faithful plant at Nangal with a capacity of 14 tonnes of heavy water per year is the only one which does not let down normally. The Baroda plant was completed and went into production in July, 1977, but had to be shut down due to an accident and was to resume production only last month.

## LOBBY TO PRESSURE FORUM ON NUCLEAR TEST BAN

OW131406 Paris AFP in English 1336 GMT 13 Jul 80

[Text] Tarawa, Kiribati, 13 July (AFP)--A strong lobby was developing today to push the South Pacific forum, which meets here tomorrow, to ban the storing and testing of nuclear weapons and the disposal of nuclear waste throughout the entire region.

The New Zealand branch of the conservationist group Greenpeace has sent a representative to the forum seeking a firm commitment from the 13 governments attending it.

In a letter to forum delegates, Greenpeace said the "health, safety and rights of the peoples of the Pacific are gravely threatened by the possibility of nuclear weapons being transported or stationed in the South Pacific."

The group requested that the forum approve a "nuclear weapon-free zone initially limited to the land areas of the South Pacific," a "senior-level representation from the forum requesting France to permanently end nuclear testing in French Polynesia," "strong, concerted action to prevent any part of the South Pacific being used as a nuclear waste dumping ground" and the appointing of a "scientific mission to investigate the health, environmental and sociological effects of the French testing programme in French Polynesia."

Greenpeace representative Richard Northey said today that the nuclear-free areas were only intended as a first step towards a full nuclear-free zone.

"Once we have that accepted, we want a treaty established which would be renegotiated at forum meetings every three years," he told Agence France-Presse in Tarawa. "We are sure that with new surveillance techniques we can expand such a limited weapons-free area into a full non-nuclear zone," he added.

Mr Northey said that though many forum nations were once enthusiastic about the plan, New Zealand and Australia had since firmly opposed it. Greenpeace claims its land-based nuclear-free zone would not affect the two nations' military commitments, but the issue is expected to spark lively debate at the forum.

CSO: 5100

EIGHT NUCLEAR PLANTS CONSIDERED

Karachi MORNING NEWS 28 Jun 80 p 1

[Test] Islamabad, June 27--A feasibility report for setting up a nuclear power plant under Atomic Energy Commission's programme would be completed during the current year after which tenders for the plant would be invited.

This was stated by Finance Minister Ghulam Ishaq Khan today at his Post Budget Press conference here today.

The new budget for Pakistan's nuclear programme also provide for consultants report about setting up a nuclear power plant.

The Atomic Energy Commission's programme envisages setting up of eight nuclear power stations at a total cost of Rs. 750 crore.

The Budget documents also provide Rs. 40 crore for fuel reprocessing plant and shows that expenditure of Rs. 31 crore has already been incurred on this project.

Another important project relating to nuclear energy is exploration of uranium reserves in Dera Ghazi Khan which is expected to reach near-completion stage this year. Work on this project is in final phase and Rs. 1.4 crore has been earmarked for it.

Out of total budget of Rs. 49 crore for the Atomic Energy Commission, Rs. 43 crore has been earmarked for a reprocessing plant and nuclear power stations at Chashma in Mianwali district.

CSO: 5100

NUCLEAR POWER PLANT COST OVERRUN REPORTED

Manila PHILIPPINES DAILY EXPRESS in English 20 Jun 80 p 9

[Article by Samuel V. Senoren]

[Text]

**ESTIMATED** cost overruns in the construction of the country's first nuclear plant in Bataan have soared to a staggering \$500 million and the project is still unfinished.

The increase represents nearly 50 percent of the project's original cost.

Energy Minister Geronimo Velasco said yesterday the project cost was estimated at only \$1.2 billion in 1972 but has since then increased to \$1.7 billion mainly due to inflation and cost of added safety features.

A KEY question that Westinghouse -- builder of the plant -- and National Power Corp. (NPC), which will own it, will resolve is which of them will shoulder the added cost.

Velasco said the cost factor will be one of the major issues to be discussed by Philippine government and Westinghouse officials when they meet in New York next month.

Government negotiators will include Velasco, Finance Minister Cesar Virata and Solicitor General Estelito Mendoza.

The New York meeting will be their second attempt to resume construction of the nuclear facility.

Work on the nuclear plant was stopped by President Marcos last year following an accident in a Westinghouse nuclear facility in the Three Mile Island in the United States.

LOCAL protesters had claimed that the Bataan nuclear plant did not have enough safety features to prevent the occurrence of a Three Mile Island-like accident.

Westinghouse has offered to put up 86 additional safety factors and so far 65 have already been installed, Velasco said.

Another issue that is likely to crop up will be sourcing, financing for the additional cost.

...

THE plant was funded by loans from the US Export-Import Bank and a consortium of US banks led by Citibank. Because of their exposure in the project, it is held likely that they will provide the additional capital requirements.



## SRI LANKA

### BRIEFS

NUCLEAR ENERGY DEVELOPMENT--Yugoslavia and Sri Lanka are likely to enter into an agreement for cooperation in the field of nuclear energy. This is expected to take place at a meeting of the nonaligned nations summoned by Yugoslavia to discuss cooperation in the field of peaceful uses of nuclear energy. Official sources said that most of the nonaligned nations including Sri Lanka were expected to participate in the meeting to be held in Buenos Aires next week. Among the matters to be discussed are cooperation in nuclear techniques, nuclear energy and agreements between member countries. Several Yugoslav experts have been working in Sri Lanka on short term assignments in atomic energy projects here. Official sources said that the Yugoslav Government had expressed willingness to cooperate with Sri Lanka in the field of nuclear energy. [Text] [BK091333 Colombo THE SUN in English 1 Jul 80 p 1]

CSO: 5100

PROSPECT OF BRAZILIAN-CHILEAN NUCLEAR ACCORD DENIED

Chilean Interest in Pact

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 28 Jun 80 p 6

[Text] Santiago--Chile informed Brazil yesterday that it has special interest in signing a cooperation agreement in the area of the peaceful use of nuclear energy. In principle, the Chilean Government is thinking about signing a general agreement and a specific agreement between its national nuclear energy commission and the Brazilian Nuclear Corporation (NUCLEBRAS) during President Joao Figueiredo's visit to Santiago in October.

However, Foreign Ministry spokesman Bernardo Pericas asserted the night before that nuclear cooperation between the two countries was not extensively discussed during the talks Minister Saraiva Guerreiro held with Chilean authorities. It was agreed that later Chile would send through diplomatic channels the details of agreements it intends to sign in the atomic energy area.

The report prominently published by the Chilean press, to the effect that the United States and Peru had signed a nuclear agreement, was widely disseminated in Santiago. EL MERCURIO, the most influential newspaper in Chile, published the report on its front page, pointing out that through this action Peru had become the third country in Latin America that could obtain fuel, material and technology to develop atomic energy.

After 2 days of negotiations between Minister Saraiva Guerreiro and Chilean authorities, the conclusion was reached that Chile would like to sign 14 agreements with Brazil during President Figueiredo's visit, the same number signed between Brazil and Argentina during Figueiredo's recent visit to Buenos Aires.

The 14 agreements proposed by Chile pertain to the following areas: nuclear cooperation, maritime transportation, an agreement between the National Scientific and Technological Council (CNPq) and CONICYT (its Chilean counterpart), tourism, social security, teledetection of natural resources,

biomass, health cooperation, fishing cooperation, nontransmittable chronic diseases, data-processing, cooperation in the field of trade promotion, an agreement between the Chilean Diplomatic Academy and the Rio Branco Institute, and reciprocal recognition of drivers' licenses to facilitate tourism.

Brazil suggested only one agreement, which was also signed with Argentina during President Figueiredo's visit: one which seeks to avoid double taxation.

Studies are more advanced in the following areas: maritime transportation, the CNPq-CONICYT agreement, and tourism and social security. During yesterday's talks, Chile presented what it calls the "drafts" of three new agreements: fishing cooperation, trade promotion and biomass, and suggested changes in the text of the maritime transportation agreement.

#### Denial of Nuclear Agreement

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 27 Jun 80 p 6

[Text] Santiago--Brazil yesterday discouraged any Chilean attempt to hold negotiations now for the possible future signing of a nuclear agreement between the two countries. While still aboard the plane that brought Minister Saraiva Guerreiro and his retinue to Santiago, Foreign Ministry spokesman Bernardo Pericas discounted that prospect. The previous evening, Chilean Foreign Minister Rene Rojas had told the press when he was asked if Chile and Brazil might sign a nuclear agreement: "I think so. That is an area of interest not only to explore but also to seek coinciding points and, if possible, to reach an agreement. Brazil has devoted much attention to and has achieved great progress in that technology."

However, Minister Saraiva Guerreiro denied that his visit is part of a continental "offensive" by Brazil, when questioned at the Santiago airport by Chilean reporters. He described his visit as a natural step in the relationship between the two countries, which have always had an excellent dialog. He also denied that he had brought any kind of message from President Joao Figueiredo to President Augusto Pinochet, pointing out that Figueiredo will come personally in October and will speak directly with the Chilean general. It is not known if Guerreiro deliberately preferred to use the terms "people" and "country" when he referred to Chile, not mentioning the term "government." That policy was maintained with one exception, in the speech last night in which Guerreiro expressed thanks for being decorated with the Grand Cross of the Order of Bernardo O'Higgins. The minister again used the term "country" and referred to "Brazilians and Chileans" but at the end he asked that Foreign Minister Rene Rojas Caldamez thank President Pinochet for the honor he had received.

Foreign Minister Rojas accepted the game of subtleties, inserting into his greeting speech a reference that fits Argentina in the Beagle dispute. After

mentioning the "community of aspirations and objectives" between Chile and Brazil, the Chilean minister said that there is a "similar view" on world events, and pointed out: "There is, above all, complete trust in international law and in respect for treaties, the validity of which we know to be the best guarantee of peace, stability and cooperation in international relations."

Rojas also praised the Brazilian Foreign Ministry, which he described as an "old and prestigious" foreign ministry at the service of a "wise, judicious and dynamic" foreign policy.

#### In the Press

This image of competence also appears clearly in the cover reportage the magazine HOY devotes to Guerreiro's visit in the edition that reached the newstands shortly before the minister's arrival. HOY is an independent magazine that expresses the thinking of the Christian Democrats and maintains the position of a moderate resistance front toward the Chilean military regime.

Guerreiro (HOY cover) emerges in the inside pages as a foreign minister of discreet temperament, who is pushing the diplomacy of "ecumenical pragmatism," that was born under former President Geisel and is being followed by Figueiredo. The report, signed by one of the magazine's directors, Abraham Santibanez, recognizes that there is a school of "deep tradition" in the Foreign Ministry that has survived diverse governments in the last 20 "uneasy" years, having merited the respect of all of them. The Foreign Ministry is described as now the "most demanding" school in Latin America.

HOY says sarcastically that at the very outset of his administration the announced political opening of President Figueiredo received the double "blessing" of West Germany and European Social Democrats. And it notes among the skills of the Foreign Ministry the tilt toward the Arabs and Black Africa after the equidistant position in the Middle East and its support for Portuguese colonialism. It also describes as pragmatic the rapprochement with China. According to the magazine, it was in deference to that policy that President Figueiredo did not appoint Ambassador Roberto Campos as foreign minister. "It was said in Brasilia that, out of deference for his predecessor, he did not want to select Roberto Campos to the Foreign Ministry in order not to appear excessively anxious to make up with the United States. As is known, Campos was always pro-American to the core." The magazine also points out that Brazil today is the largest manufacturer and exporter of arms in Latin America.

#### Pinochet

Minister Saraiva Guerreiro will be received today by President Augusto Pinochet, who will give a luncheon in his honor. Guerreiro will also hold

the second round of talks with Chilean Foreign Minister Rene Rojas. Today, the joint Brazilian-Chilean cultural commission will be installed and Guerreiro will place a wreath at the monument to Bernardo O'Higgins.

#### In Rio Another Version

Despite the denials, members of the diplomatic and trade delegation commented in Rio yesterday before leaving for Chile that an agreement on cooperation in the nuclear area might emerge from the visit which Minister Saraiva Guerreiro began to that country yesterday.

The members of the mission reported that one of the main topics to be discussed is energy, pointing out that, according to statements by the Chilean foreign minister himself, Rene Rojas, Chile is very much interested in signing an agreement with Brazil in the nuclear area.

Those members of the Brazilian delegation believe that it is premature to talk about the matter despite admitting the possibility that the subject may be dealt with during Saraiva Guerreiro's contacts with Chilean authorities. Other topics to be discussed by the minister will be PROALCOOL and the possibility of joint oil exploration in the southern part of the continent.

One member of the Brazilian delegation stressed, however, that only after the meeting of the joint Brazilian-Chilean commission that will be held during Guerreiro's visit will it be possible to report on the types of agreements and accords of interest to the two countries.

The Brazilian delegation that accompanied the foreign minister includes mainly representatives of the Ministry of Industry and Commerce, businessmen and other Foreign Ministry officials, among them Joao Hermes de Araujo, chief of the America Department, and Botafogo Goncalves, chief of the Secretariat of Economic Cooperation.

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CSO: 5100

VALUE OF NONALIGNED NUCLEAR MEETING'S OBJECTIVES DOUBTED

PY092103 Buenos Aires LA PRENSA in Spanish 8 Jul 80 p 8

[Editorial: "Ambiguity in Our Foreign Policy"]

[Text] Our country has had the dubious privilege of playing host to the first meeting of nonaligned countries for the coordination of the peaceful use of nuclear energy. Delegates from 18 governments--none of them from the Americas, except Cuba--attended this conference which grouped this diverse, ever-changing and at best undefined international conglomerate.

We are making this explanation because certain members of this heterogeneous international group that have clear and well-defined policies are the unconditional and docile allies of Soviet imperialism. This is precisely the case with Cuba, which during last year's spring conference in Havana achieved the leadership and representation of this disparate group of nations. Strangely enough, the only one that tried to obstruct this dubious leadership during last year's conference was another communist country, Yugoslavia, whose well-known rebellion against Soviet orthodoxy is a mere formal element of difference, since the basic ideology in Yugoslavia is practically the same as that enforced in Cuba during the past 2 decades.

The fact is that Argentina has been the host nation for a discouraging meeting. The presence, moreover, of the already-mentioned Cuba, and of representatives from Libya, Algeria, and Iraq, whose political regimes are in complete opposition to our historical and institutional traditions, poses a natural and quite difficult question. Even more so, since the Navy Commander, who is also a member of the military Junta, recently reaffirmed during the U.S. Navy Secretary's visit to Argentina the validity of their "alliance of principles" and Argentina's commitment to Western ideals.

In view of this, the public cannot but ask itself what the guidelines of our foreign policy are and what criteria are used to express, enforce and manifest our foreign policy. It is inconsistent for Argentina to express at the highest levels of power our support for the principles common to the so-called free world. And at the same time on a matter of such strategic importance as nuclear policy to side with those who may be our future adversaries.



Our world is today undergoing a period of uneasy uncertainty. This has been shown by recent incidents, and qualified experts uniformly express pessimism. This then is a time when the Argentine Government must be precise in its guidelines and its decisionmaking. It is impossible to support a genuinely liberal and antitotalitarian position and simultaneously encourage commitments to openly communist nations, or at least with pro-Marxist governments.

This lack of coherence between what is officially stated and what is actually done is even more obvious because Argentina's participation in this conference was not merely as one of the participants in an international event, since it was held on its own territory under the auspices and with the sponsorship of its authorities.

The argument that the meeting was called for the purpose of achieving peaceful objectives or for the purpose of establishing the much-sought technological support, is not a valid excuse. For the majority of those nations that make-up the so-called "Third World" and which are in an incipient stage of industrial development, the mere attempt to use nuclear energy--which is a potentially lethal element, whether for peaceful purposes or not--is an impossible dream. This is not, however, the case with Argentina which has achieved obvious progress in this area, but it is the case of, for example, countries such as Niger, Gabon, or the Central African Republic, all of which attended this conference and all of which have emerged in recent years from a tribal societies with slight improvement by the actions of declining European colonialism which tried apparently unsuccessfully to transform them into members of the civilized community of nations.

The obvious unhappy results of this heterogeneous conference were foreseeable. The disagreements did not stay within the restricted limits of the talks, and had to be extended beyond the date initially scheduled for the closure of the conference because of a lack of agreement between the attending delegates. The text of the agreements that were approved were not disclosed. Instead only a parsimonious and brief final communique was issued. This communique does not report any positive result of the conference and it only slightly disguises the disagreements during the meeting. We must agree that, with few exceptions, those nations that attended this conference have a complete lack of technology which forces them into dependence, in a field as complex as nuclear energy, on the large industrialized nations. Whatever is decided or approved regarding this delicate issue, therefore, will be of relatively little value.

Moreover, the discussion of whether to use nuclear energy for peaceful purposes or not by many countries that do not yet have access to it, is nothing more than a simple expression of aspirations.

What is more, if viewed from a merely logical point of view, the objectives of this conference were inconsistent. Salvador de Madariaga, an eminent Spanish writer of recognized experience in international affairs, unmoved by the proliferation of nonaggression treaties 50 years ago--these were an

epidemic in these years--noted that peace could not be achieved through disarmament since disarmament was the consequence of peace and not the other way around. This is why this conference or any treaty regarding the peaceful use of nuclear energy is of little value if it is not preceded by a genuine nonbelligerent conviction and attitude. Unfortunately, however, the present world is far from achieving this.

In addition to its useless purpose, it can be said that this conference did not result in any important decision. Above all, it also helped to show an inexplicable ambiguity in our foreign policy between what are proclaimed as its guidelines and what is practiced.

CSO: 3100

# NUCLEMON DENIES DANGER OF RADIOACTIVE CONTAMINATION

Rio de Janeiro O GLOBO in Portuguese 10 Jun 80 p 21

[Text] NUCLEMON [Nuclebras Monazite and Associated Elements, Ltd.]--a subsidiary of NUCLEBRAS--issued an official note on 9 June affirming that there is no danger of radioactive contamination in the water, soil and plants in the region of Itu, Sao Paulo State, where the company has a deposit of Torta II, a monazite sand byproduct. According to the note, NUCLEMON has adopted "additional measures to strengthen security by reinforcing the earth walls, permanently measuring the radioactivity on the site and making the existing guard a resident watchman."

The NUCLEMON note states the following:

1. The Botuxin deposit is located approximately 20 kilometers from Itu, Sao Paulo, and in it is deposited Torta II, a byproduct of the treatment of monazite sands by NUCLEMON, a NUCLEBRAS subsidiary. The deposit is made in basins specially constructed for that purpose, according to a project approved by the CNEN [National Nuclear Energy Commission]. The designation of the area for that purpose was the decision of the former CBTE [Brazilian Nuclear Technology Company], a CNEN subsidiary. Being a rural area, according to the Itu Construction Code, there was no need for a license from city hall.
2. Torta II is a compound containing approximately 21.7 percent thorium and 0.9 percent uranium. In the Botuxin deposit, there are roughly 2,500 tons of Torta II, with 550 tons of thorium and 20 tons of uranium. Part of that material--that which was produced up to August 1976--belongs to the CNEN.
3. In response to a request for information from the mayor of Itu, CETESB [Basic Sanitation Technology Company] conducted an on-site inspection in October 1979 and did not find levels of radiation higher than those permitted, discussing the matter subsequently with the CNEN.

4. As a result of the discussions between the CNEN, NUCLEMON and NUCLEBRAS, additional inspections were conducted at the site which again indicated that there was no radioactive pollution of the environment and particularly the local waters. Nevertheless, some additional measures were taken to increase security such as strengthening the earth walls, adopting a permanent radiometric monitoring system and making the existing guard a resident watchman at the site.

5. On 15 April 1980, the president of CETESB wrote an official letter to the mayor of Itu apprising him of the aforementioned events, informing him, moreover, that although no levels of radiation higher than the permissible levels had been detected, a sample of water had been collected and analyzed simultaneously and independently by CETESB, IRD (Radio-Protection and Dosimetry Institute) and CDTN (Nuclear Technology Department Center), the results of which proved that there was no danger of radioactive contamination in the water, vegetation and soil of the local streams.

CSO: \$100

NEW LASER METHOD BENEFITS NUCLEAR FIELD

PY071852 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 4 Jul 80 p 33

[From the Rio De Janeiro Agency]

[Excerpts] The process of isotopic separation with the use of laser rays that has been discovered by a UNICAMP [Campinas University] team has passed through all the laboratory tests, in which the separation of light and heavy elements was detained, thus opening up new prospects for Brazil in the nuclear field. In the future, the sector will be able to count on industrial processes for the production of heavy water, and it will also have another alternative for the enriching of uranium, in addition to the German "jet nozzle" process that is being adopted by the Brazilian nuclear sector.

This information was revealed yesterday during the "Sergio Porto Memorial Symposium on Laser Application," which closed yesterday in Rio De Janeiro. The Symposium was held in honor of the scientist who initiated the research and formed the first UNICAMP team and who died last year in the Soviet Union. The best laser specialists from throughout the world participated in the symposium, in which it was also confirmed that the process can be applied to other industrial processes, such as the production of raw material, starting with bituminous schist, for the petrochemical industry.

In view of the discoveries made by the UNICAMP team, technicians and professors from the CTA [Aerospace Technical Center], the USP [Sao Paulo University] and the IPEN (Nuclear Energy Research Institute) are currently holding a meeting. According to Professor Chin-Tsu Lin, who has been heading the research since the death of Sergio Porto, the government has not refused resources or support, as they have been supplied through agreements with NUCLEBRAS [Brazilian Nuclear Corporations], FAPESP [Foundation for Research Assistance of Sao Paulo State], FINEP [Corporation for Financing Studies and Projects] and CNPQ [National Scientific and Technological Development Council]. [passage omitted]

The pilot plant has confirmed the technical and economic viability of the process for manufacturing heavy water and of the process for enriching uranium, but it will be some time before Brazil will be able to manufacture its own lasers, which are currently imported. The manufacture of hexa-fluoride (hexafluoreto) will be viable as soon as the country is in a position to manufacture lasers with a frequency of 16,000 micros, as well as special metal sheets, because uranium has a very high degree of corrosiveness. This team is carrying out plasma and nuclear fusion [fusao nuclear] programs and it has already obtained deuterium, an essential raw material. With two deuterium atoms a helium atom is created and fusion can be obtained, at least theoretically, for the separation of the hydrogen.

Professor Chin-Tsu Lin has asserted that the production of heavy water through excitation with laser rays is being researched in the United States and in the Soviet Union, but to date the experiments carried out in those countries have not had economically viable results, while the research carried out by the Unicamp team has already passed those stages. He also revealed that the production of raw material for the petrochemical industry (ethyl), starting from bituminous schist, through laser impregnation will bring enormous advantages for Brazil as related to other countries because it will free the country from importing a large range of products for the petrochemical industry.

Chin-Tsu Lin has also asserted that using the laser ray process with bituminous schist will prevent the pollution of cities because it can be used in the field itself with mobile units, extracting the raw material "in loco" [given in Latin] and not in thick plaques of schist that would have to go through the conventional thermal process. [passage omitted]

CSO: 5100



SOUTH AFRICANS CLAIM A BREAKTHROUGH IN NUCLEAR FUSION

Capetown DIE BURGER in Afrikaans 25 Jun 80 pp 1, 5

[Text] South African researchers have made an important breakthrough in their search for nuclear power from nuclear fusion which in the coming century will be supplying a nearly inexhaustive source of "cleaner" nuclear power.

In the course of a statement the Atomic Power Council made the announcement that for the first time researchers have succeeded in controlling a stable atomic plasma through magnetic limitation by means of a Tokomak [probably derived from the Russian abbreviation for current maximization] apparatus developed in South Africa. This is the first important step in the process of nuclear fusion.

The Atomic Power Council undertook the research program for hot plasma in 1975 and for this purpose the Tokomak-apparatus, or as it is generally known in South Africa--the Tikoloshe, was designed and built in the nuclear research center at Pelindaba.

This has recently been put into operation and will be used on an experimental basis for the study of magnetically confined plasmas for gaining knowledge in nuclear fusion.

Explanation

Prof Chris Engelbrecht of the physics department of the University of Stellenbosch yesterday explained what is meant by nuclear fusion and how nuclear power which is released as a result of this can be a nearly inexhaustible source of "clean" power for humanity.

In contrast with the power which is generated in a nuclear power station such as Koeberg in the Western Cape by splitting uranium atoms, the objective of nuclear fusion is to have the nuclei of heavy hydrogen (deuterium) fuse together or have the nucleus of an even heavier hydrogen (tritium) fuse with that of deuterium. Solar and stellar energy is released by the fusion of deuterium nuclei.

One of the great advantages of fusion over fission is the nearly unlimited supply of heavy water (this occurs in all natural forms of water on Earth) as against uranium, which is obtainable in limited quantities in certain quantities in certain countries. Moreover the savings in the long run are quite obvious: from 1 liter of water enough deuterium can be obtained to produce the power of something like 200 liters of petroleum.

#### Safe

Moreover, with respect to the danger of pollution, nuclear fusion has an advantage over the Koeberg type of power. To be sure radioactivity is released during fusion, but it is less dangerous than the radioactive radiation produced by fission. Also the waste which results from fusion, which also includes helium, is completely harmless.

There are three great stumbling-blocks in the path of successful nuclear fusion and the controlled utilization of the power which is released. First of all, after ionization, the deuterium and tritium nuclei must be compounded into a gaseous plasma state. An example of such a plasma is the contents of a light tube which is converted into light energy through an electrical field.

It is here that the South African researchers have made a breakthrough. They have contrived to do what few other countries have thus far been able to do, namely: to control a quantity of stable plasma in a magnetic field by means of the Tokamak-apparatus. Such a plasma is unstable by nature and to bring this about is already a great achievement.

But this is merely the first step on the path to nuclear fusion. Now, in the case of pure deuterium nuclei, the plasma must be heated to 300 million degrees centigrade by means of electric power in order to make them fuse and in cases where deuterium nuclei must be fused with tritium nuclei the temperature has to be 50 million degrees C.

Because no known solid material can resist such high temperatures it is necessary for the magnetic field to insure that the tremendously heated plasma remain, as it were, hanging in air and in no circumstance touch the wall of the container.

#### The Research

The last problem is the controlled conversion of the power, released through nuclear fusion, into electrical power. According to Prof Engelbrecht the last two steps in the fusion process will require enough re-searching to keep researchers busy at least until the next century.

The Tokamak-apparatus was originally developed by the Russians during the sixties and thereafter both the United States and Britain conducted the research further at full speed.

What is needed to get the process going is "Hell's fire" and this is what led to the idea of tikoloshe, according to Prof Engelbrecht.

Dr Jacobsen had first thought of a name which would be indicative of "Hell's fire" and it was here that Prof Engelbrecht proposed that he would rather use the authentic South African tikoloshe.

Nuclear fusion has already been carried in the explosion of the hydrogen bomb. The only way of heating hydrogen atoms to such a degree that an explosion occurs is to employ a nuclear bomb as a detonator.

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CSO: 5100

## BRIEFS

NUCLEAR POWER PROBLEMS DISCUSSED--From 30 June to 3 July 1980 a meeting between an Austrian and a Czechoslovak experts delegation was held in Brno, to discuss problems connected with nuclear power plants situated close to the border. Earlier meetings of that type had been held in June 1979 and in January 1978. The two experts delegations discussed the development in the nuclear energy sector of the two states since the last round of talks of June 1979 as well as questions of exchanging information, technical problems, and fundamental aspects of alarm plans. The talks were held at a professional-technical level and in a friendly-cooperative atmosphere. Recommendations were worked out regarding questions that had remained unresolved at the June 1979 round of talks, with a view to achieving concrete results which will now be submitted to the competent government authorities of each country. They are to serve as a basis for negotiations at diplomatic levels aiming at the conclusion of a bilateral agreement on the subject. [Text] [AU081128 Vienna WIENER ZEITUNG in German 8 Jul 80 p 2]

CSO: 5100

## TUBING OF FESSENHEIM-1 REACTOR SHOWS CRACKS

Paris LE MONDE in French 15-16 Jun 80 p 14

[Text] The Fessenheim-1 Powerplant (Haut-Rhin) has small cracks in some of its components. The recent commissioning by the Commissariat for Atomic Energy of automatic testing apparatus, the MIS (machine for inspection during operation), disclosed such defects in two of the reactor tubes.

These large-size parts connect the reactor drum with the primary core-cooling circuit. Some months ago already, some specialists advanced the hypothesis that the Fessenheim and Bugey power plants, built according to different industrial procedures from those which followed them, did perhaps not have cracks such as those found in the Gravelines, Tricastin and Dampierre reactors.

In a statement issued on 13 June, the management of the Fessenheim establishment considers that, according to the most pessimistic hypothesis, difficulties could possibly occur in about 30 years and states that the second Fessenheim reactor will be subjected to tests in September.

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CSO: 5100

## URANIUM DISCOVERED IN GIRONDE DEPARTMENT

Paris L'USINE NOUVELLE in French 5 Jun 80 p 83

[Article by Claude Goudier: "Uranium - 20,000 metric tons in Gironde"]



Newly discovered uranium deposits at Coutras, near Bordeaux, increase French reserves by 20% - their exploitation could start within eight to nine years.

[Text] Even after more than a thousand drillings, done over a period of two years, it was a well-kept secret: there is uranium in the French South-West; in the Coutras region located 40 km northeast of Bordeaux.

Discovered by COGEMA [General Company for Nuclear Materials], an industrial branch of the French AEC, these important deposits could provide, according to geological evaluations, reserves close to 20,000 metric tons (equal in energy to 200 millions metric tons of heavy oil). It should be noted, for comparison, that according to international evaluations France disposes of some 100,000 metric tons of uranium.

The uranium deposits are located between surface and 100 meters depths, in sedimentary formations created during the eocene (early period of the Tertiary) held in a depth between 0 to 110 m. Mr George Besse, Cogema president, has been careful to indicate that, at this stage, "it is to



early to pick a specific date for the start of the exploitation. Many years, probably eight to nine, of work will actually be required before any decision can be made."

This discovery, which increases French reserves by 20 percent ("French underground riches can still manage us some surprises" is the opinion at French AEC) is another supplementary insurance for the orderly development of the nuclear-electric program, scheduled to reach its full development in 1985. Year in, year out, Cogema disposes of some 6000 metric tons of uranium, which are a fraction of the odd 35,000 metric tons produced in the Western world. It produces this amount either directly, from its own mines located in France, or through share ownership in African mines (Niger and Gabon). This quantity is sufficient to supply the current atomic power plants; but it will have to be increased in the future. Each year, a 900MW generating plant requires more than 100 metric tons of natural uranium.

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CSO: 5100

## PROBLEMS CONFRONTED IN NUCLEAR SCIENCES

Istanbul MILLIYET in Turkish 21 May 80 p 2

[Article by Prof Dr Irfan Urgancioglu, Istanbul University Cerrahpasa Medical Faculty teaching member and Nuclear Medicine Institute director]

[Text] The first National Nuclear Sciences Congress will convene in Izmir 20-24 May 1980. Considering the stage that nuclear science has reached in Turkey, it may be thought that it is late to be starting congresses of this type, because they have the special nature of creating the atmosphere for and stimulating debate on the subject.

Nuclear energy not only has a significant place in every field today from industry to agriculture, but touches as well on almost every subject in medicine from basic research to early recognition of cancer.

Nuclear medicine was one of the earliest branches of nuclear science to be taken up and developed in Turkey. Long before ratification and publication in 1956 of law no 6821 on establishment of the [Turkish] Atomic Energy Commission [TAEC], Prof Suphi Artunkal and his colleague Prof Sait Akpınar established the first nuclear medicine laboratories in Turkey in 1952. Development of nuclear science was more rapid and comprehensive after passage of the law on establishment of the Atomic Energy Commission but the contribution of the TAEC to development of the branches of nuclear science has always been limited.

## Expensive and Very Diverse

Development of nuclear science, especially nuclear medicine, depends as much on the availability of trained personnel as on existing ways and means. The equipment and materials used in the nuclear sciences are very expensive and the training of personnel must be very diversified. One reason for the founding of the International Atomic Energy Agency (IAEA) and of atomic energy commissions in almost every country was "to regulate all scientific and technical research in the field of atomic energy, to ensure the establishment and operation of the necessary laboratories and to

form and foster the formation of new research organizations as opportunity and need dictate." It would be well, then, to summarize the major problems confronting nuclear science in Turkey, especially nuclear medicine, and to discuss TAEC contributions toward resolving these problems:

1. The problem of assisting in the outfitting of every laboratory or organization working in nuclear science; the TAEC has tried to be of significant assistance by instituting certain legal facilities within the framework of existing laws, exemption from customs duties, for example. This right, even though granted only to public establishments, has still been very beneficial.

2. The problem of assisting in the orderly and correct function of existing equipment and material; this equipment, most of which is electronic, requires highly technical personnel. The technical personnel at this level in Turkey are both limited in number and very costly. It is therefore necessary to train or assist in the training of this type of personnel. The TAEC is organizationally inadequate in this regard. Although the CNAEM (Cekmece Nuclear Research and Training Center) and the ANAM (Ankara Nuclear Research Center) have very valuable personnel and although they do valuable research here, these centers are not set up to train technical personnel in the numbers and functions to fulfill the nation's needs. CNAEM may soon be able to supply the nation's radioisotope requirements in large measure and ensure significant foreign exchange savings, but it is unable to provide these services at present owing to construction of a new and larger reactor.

The need for technical personnel in the nuclear sciences was taken up not long ago by the Turkish Scientific and Technical Research Organization [TUBITAK], which made and implemented plans to train teachers for the training of high-level technical personnel. The TAEC ought to contribute to this project and introduce without delay an organization for this purpose within its own structure for the future. In this way, technicians could be made available to the organizations working in the nuclear sciences. Another short-term solution which may be considered would be technical assistance in the form of having the TAEC send its own physicists and chemists to these organizations.

3. The problem of equipment maintenance, standardization, repair and spare parts at the organizations working in the nuclear sciences; the organizations working in nuclear science, especially the nuclear medicine laboratories, are trying to handle equipment maintenance, standardization and repair however they can and usually with their own physicists. Thus some are lucky and some are not, depending on the personnel available, because these technical personnel have had practically no electronic training. The duty here also falls upon the TAEC. A "central electronic maintenance and repair shop or institute" open to the organizations working in nuclear science could be used both to provide this function and as a place of education and instruction to ensure adequate opportunity for personnel training.

<sup>a</sup>Atomic Energy Commission, function and duties, from "Cumhuriyetimizin 50. Yil Yayinlari," Dogus Matbaasi, Ankara.

However, this in itself is not considered adequate. Some of the equipment cannot be moved for many reasons. A large truck or bus, as proposed to TUBITAK, could be outfitted with all types of electronic testing and repair equipment and competent personnel, creating "a mobile electronic maintenance and repair unit."

As for the spare parts problem, an important and very expensive piece of equipment may go unused for months or even years in the health institutes owing to the inability to obtain spare parts, a situation not infrequently encountered. The answer to this may be to keep a certain amount of foreign exchange reserves at the disposal of the TAEC to use for the purchase of a spare parts supply or of important spare parts not in stock.

#### To Facilitate Work

Doubtless, the work at the nuclear science organizations, at least at the nuclear medicine laboratories, would be greatly facilitated by taking all these measures. They constitute a large part, if not all, of the problems in the nuclear science organizations. Perhaps, in order that these and other measures may be taken, concomitant changes should be made in the TAEC law and the TUBITAK law. It is to be hoped that the TAEC's contribution to the development of nuclear science would be greater with these changes. In this way, support for nuclear science research projects may be possible in a way similar to the TUBITAK project support policy. It must not be forgotten that nuclear energy is among the remedies being considered for the world energy shortage and that Turkey must have a serious plan and program in this regard.

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